7 August 1996

MEMORANDUM FOR Defense Technical Information Center, ATTN: Ms Gretchen Schlag, 8725 John J. Kingman Road, Suite 0944, Fort Belvoir, VA 22060-6218

SUBJECT: Submission of research paper, "Distribution of DoD Dental Classification, Navy"

1. Enclosed is a printed copy of the research paper, "Distribution of DoD Dental Classification, Navy," dated May 1996, by Thomas M. Leiendecker, Forest R. Poindexter, and John E. King. Please place this into the Defense Technical Information Center retrieval database, and inform the authors of the DTIC report number assigned.

2. Also inclosed is a diskette with a Micro Soft Word document of the same research paper for your use in digital archiving.

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DISTRIBUTION OF DOD DENTAL CLASSIFICATION

NAVY

Prepared by:

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May 1996

from the

1994 TRI-SERVICE COMPREHENSIVE ORAL HEALTH SURVEY

Conducted by CDR A.K. York, USN; LTC F.R. Poindexter, USAF; and LTC M.C. Chisick, USA

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BACKGROUND

The purpose of this report is to analyze the distribution of personnel of the US Navy/Marines relative to the Department of Defense (DoD) Dental Classification system. Data on the oral health status, dental treatment needs, dental utilization, and satisfaction with military dental care of the Army, Navy, Air Force, and Marines were collected, combined, analyzed, and reported in two volumes titled "1994 Tri-Service Comprehensive Oral Health Survey" (York A.K., Poindexter F.R., and Chisick M.C.). This report limits the study population to Navy/Marine personnel only, and includes data from both enlisted recruits and non-recruit active duty when appropriate. Navy/Marine data are aggregated except where indicated. The definitions and criteria for DoD Dental Classification are contained in the Appendix.**

METHODS

1. Survey Instruments

This cross-sectional survey of active duty personnel and recruits involved collection of quantifiable data from individual airmen, sailors, and soldiers. These data categories included oral health status, dental treatment needs, dental utilization, and perceived need for dental care. Data collection was done using two forms: a clinical exam form and a patient questionnaire. Direct data entry onto notebook computers provided "paperless" data collection and transmission. Clinical exam data was completed by calibrated dental examiners and trained recorders.

2. Clinical Examination

The clinical exam form is divided into five sections. The first section, patient demographic data, was collected by the dental examiner, questioning the patient as necessary to insure accuracy. The remaining sections of the clinical exam collected data on oral health status and treatment needs including prevalence of soft tissue conditions, caries status, clinical discipline-specific treatment needs, and DoD dental classification. **Examiners were instructed to record treatment needed to optimize the patient's oral health, taking into consideration that patient's individual circumstances, and assuming there were no barriers to providing care.**

** For a thorough discussion of the background and methods of this study, see the 1994 TSCOHS Active Duty Report #ADA 299418 and the Recruit Report #ADA 299414 which are available by request from the Defense Technical Information Center Reference and Retrieval Desk, 8725 John J. Kingman Rd., Ste 0944, Fort Belvoir, VA 22060-6218

Diagnosis using current radiographs was also required to fully assess oral conditions, treatment needs, and DoD dental classification. Panoramic radiographs less than 5 years old and bite-wing radiographs less than 2 years old were considered current. Examiners were instructed to take new radiographs, as necessary, for thorough patient diagnosis.

4. Sampling Strategy

The population of interest for this study included all active duty airmen, sailors, and soldiers in the continental United States. The sampling strategy was developed by Molajo and Associates, Consultants in the Mathematical Sciences (a civilian firm specializing in survey sampling design). Active duty personnel information was provided by the Defense Manpower Data Center. Recruits were sampled using single stage, stratified (gender and race; white, black, other), systematic random sampling. Historic data of the size and composition of the most recent year's recruit population were used to determine sample size and what specific subgroups of interest were feasible to sample in sufficient numbers to allow comparisons across study outcome measures.

Non-recruit personnel were sampled using multi-stage, stratified, random sampling. The sampling frame consisted of all Army, Air Force, Navy, and Marine bases located in the continental United States (CONUS) with populations of at least 4,000. This resulted in approximately 80% of the CONUS active duty military population being in the sampling frame. After stratifying by service, nine bases per service stratum were randomly selected with a probability of selection proportional to each base population (larger bases had greater chance for selection). Next, each selected base population was stratified by gender, race (white, black, other), and military paygrade category (E1-E4, E5-E6, E7-E9, O1-O3, O4-O10). Finally, individuals to be examined were randomly selected from each stratum.

Military members are predominantly white or black males. In order to allow valid statistical comparisons of their outcome measures with other subgroups of the recruit population, we oversampled white, black, and non-white, non-black females and non-white, non-black males. During analysis, data were weighted back to the proportional representation of each group in the actual population. The recruit sample size was 2,711 which represented the 101,072 recruits that passed through the recruit training facilities of the Air Force, Army, Navy, and Marine Corps during the six month data collection period. The target sample size, for active duty (non-recruits), was 15,924, representing 1,699,662 military personnel. For all services combined, 13,050 examinations were completed for an overall, non-recruit, response rate of 82.0%. The Navy/Marine Corps recruit sample size of 1425 represented 50,011, while the non-recruit active duty sample of 3812 represented 673,682. (See Table 1 for detailed breakout).

RESULTS

During the examination, the overall DoD dental classification and the dental classification within each clinical discipline were recorded for each person examined. Figure 1 depicts the distribution of personnel in each dental class among the populations surveyed and the overall Tri-service population.

Figure 1. Percent distribution of dental classes among USN personnel (with Tri-Service results for comparison), 1994 TSCOHS

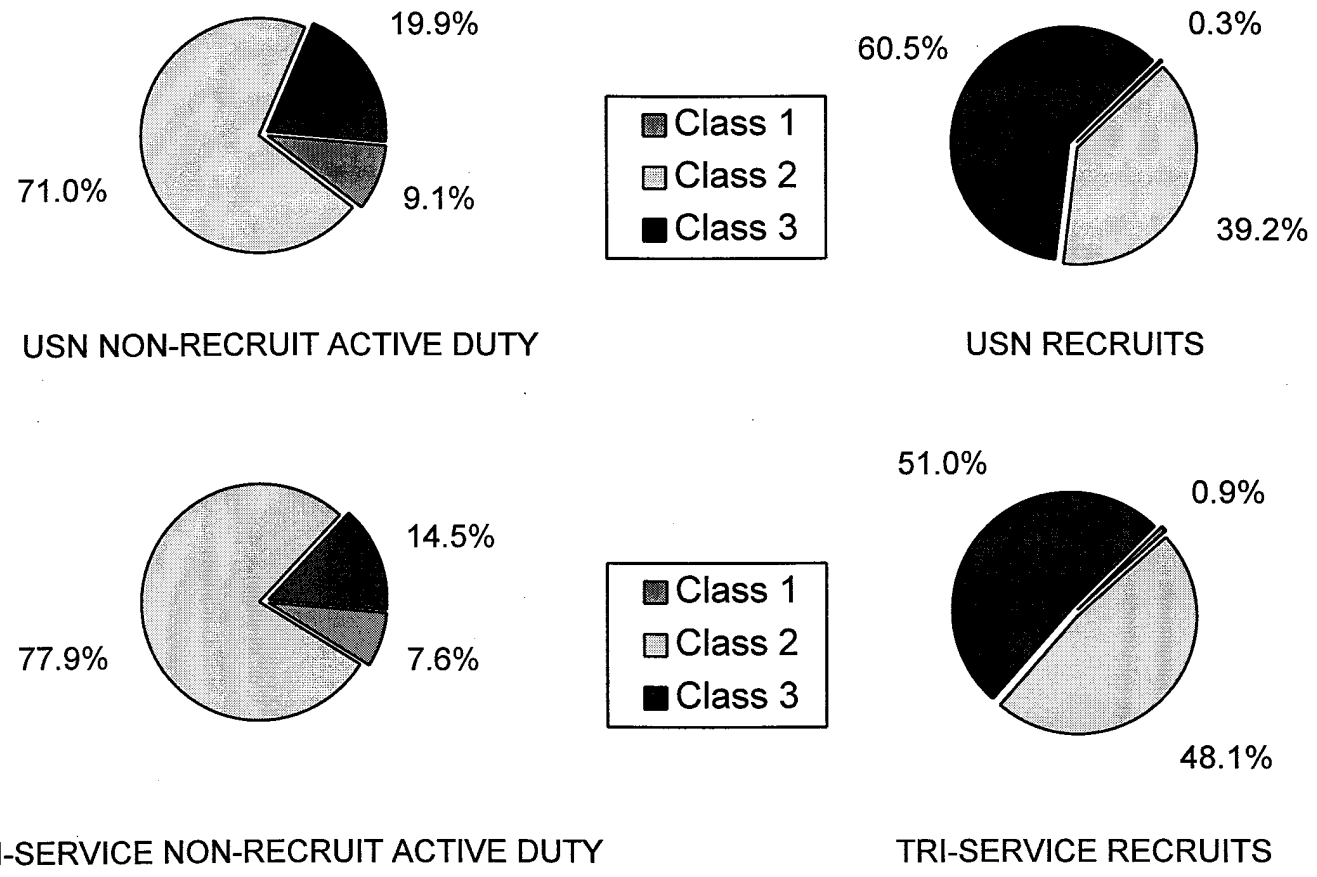
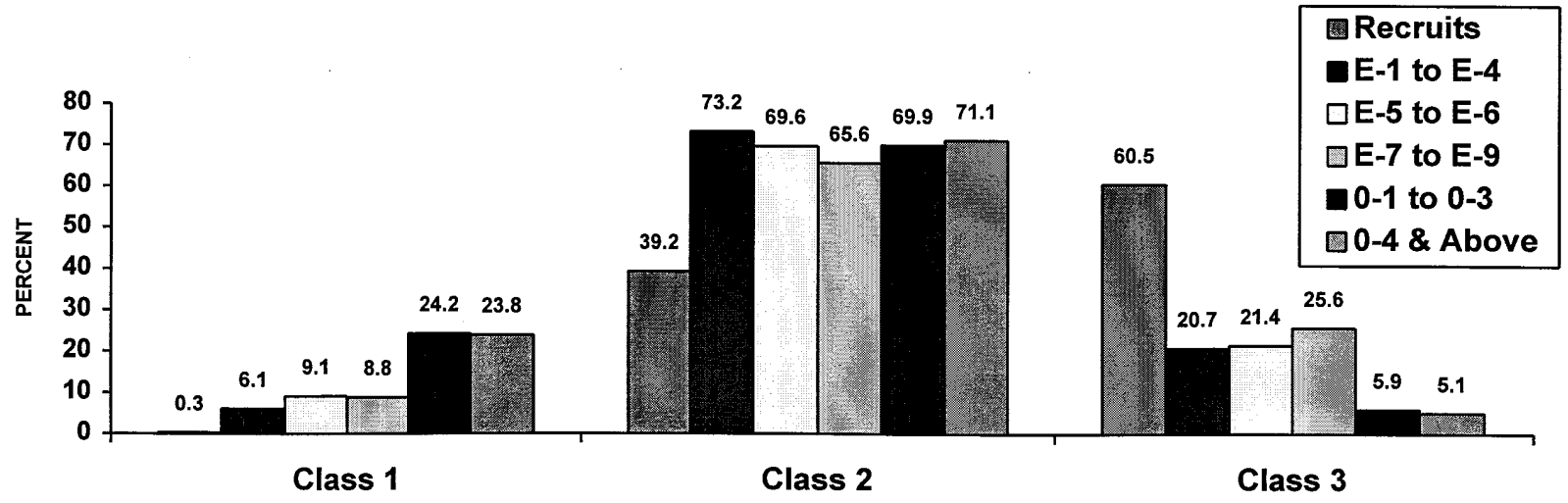


Table1 and Figure 2 present the distribution of DoD dental classification status of the Navy/Marine Corps recruit and active duty (non-recruit) sample and estimated population overall and by paygrade.

Table 1. Percent of USN Personnel in each DoD Dental Class by Paygrade and Overall, 1994 TSCOHS

	Recruits	Enlisted			Officers		Overall AD
		E-1 to E-4	E-5 to E-6	E-7 to E-9	O-1 to O-3	O4 & Above	(Non-recruit)
DoD Dental Class	%	%	%	%	%	%	%
1	0.3	6.1	9.1	8.8	24.2	23.8	9.1
2	39.2	73.2	69.6	65.6	69.9	71.1	71.0
3	60.5	20.7	21.4	25.6	5.9	5.1	19.9
Sample size	1,425	1,405	1,605	412	245	145	3,812
Population represented	50,011	312,762	234,235	61,770	47,083	17,832	673,682

Figure 2. Percent of USN Personnel in each DoD Dental Class by Paygrade, 1994 TSCOHS



Further examination of each non-recruit dental classification group using logistic regression reveals these statistically significant differences in likelihood of being in a given dental class: **officers are more likely to be Class 1 and less likely to be in Class 3 than enlisted**. (Figures 3-4) **Among Navy recruits, 99.7% require dental treatment and 60.5% enlist with Class 3 dental problems**.

Figure 3. Percent of USN Members in DoD Dental Class 1 by Paygrade, 1994 TSCOHS

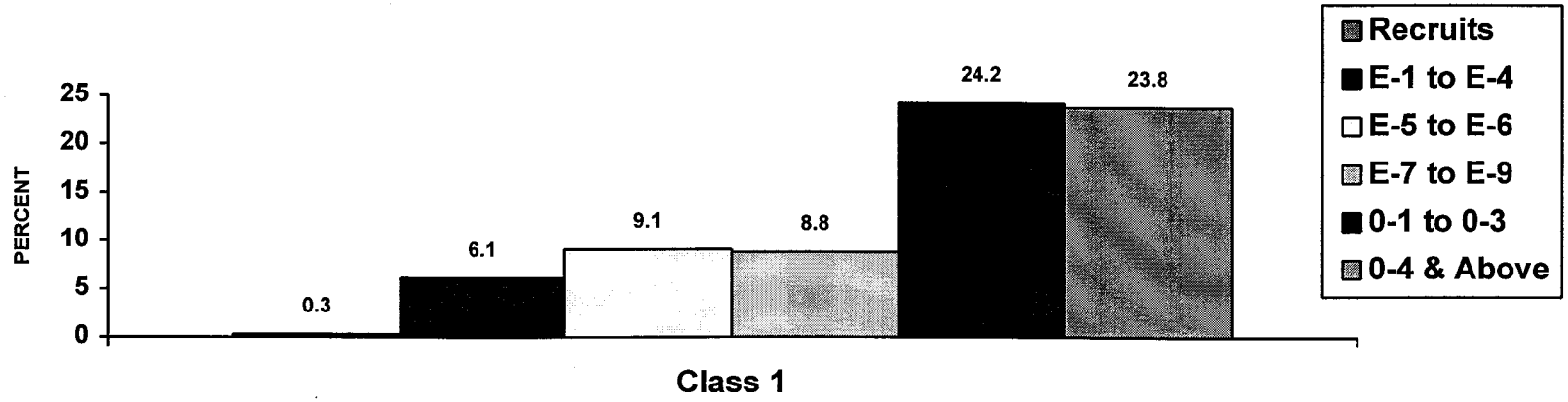


Figure 4. Percent of USN Members in DoD Dental Class 3 by Paygrade, 1994 TSCOHS

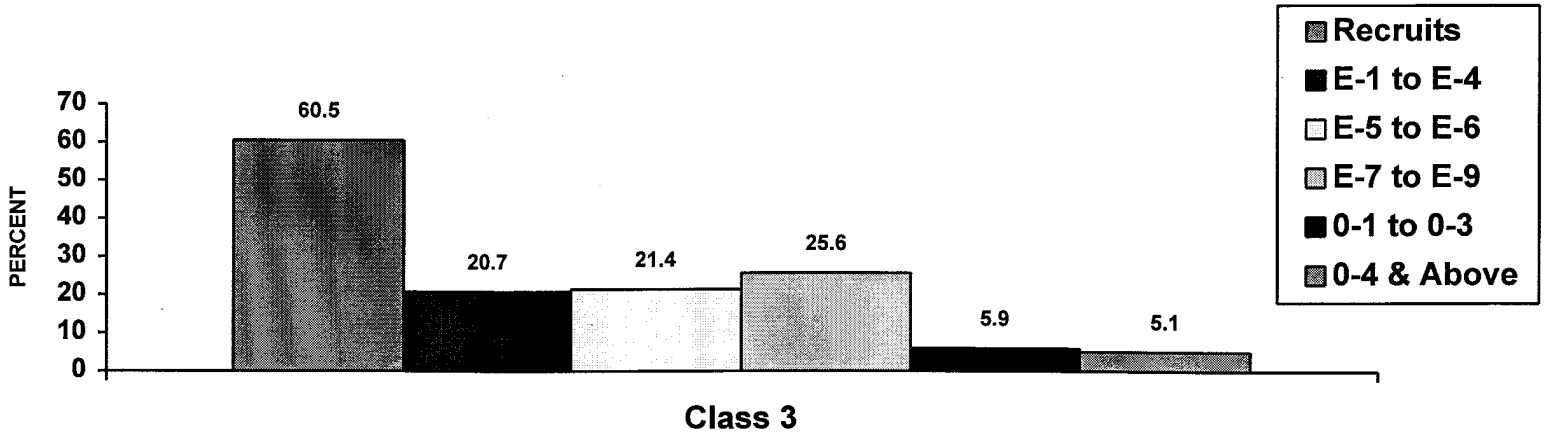


Figure 5 shows that about 40 percent of recruits arrive with dental treatment needs which place them in Class 2, while between 65.6 to 73.2 percent of all other Navy personnel are in Class 2. Although a significant amount of dental care is being provided to address the most severe problems of new accessions in order to move them out of dental Class 3, **up to three-fourths of members of all ranks continue to have need for oral health care.**

Figure 5. Percent of USN Members in DoD Dental Class 2 by Paygrade, 1994 TSCOHS

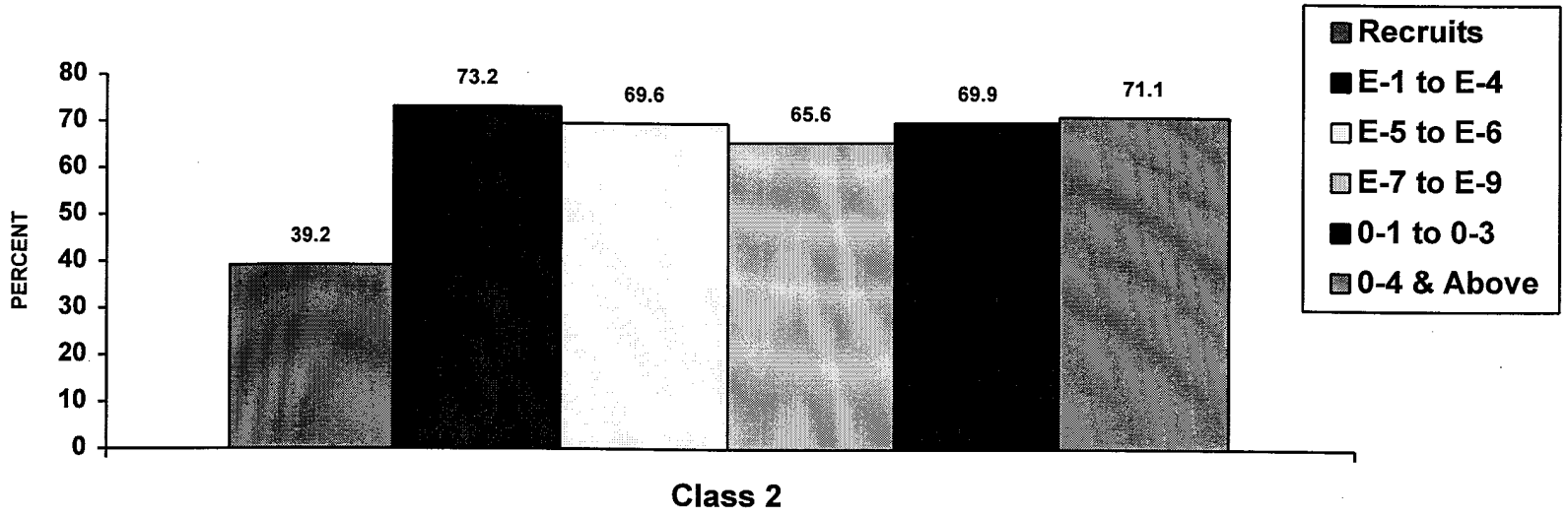
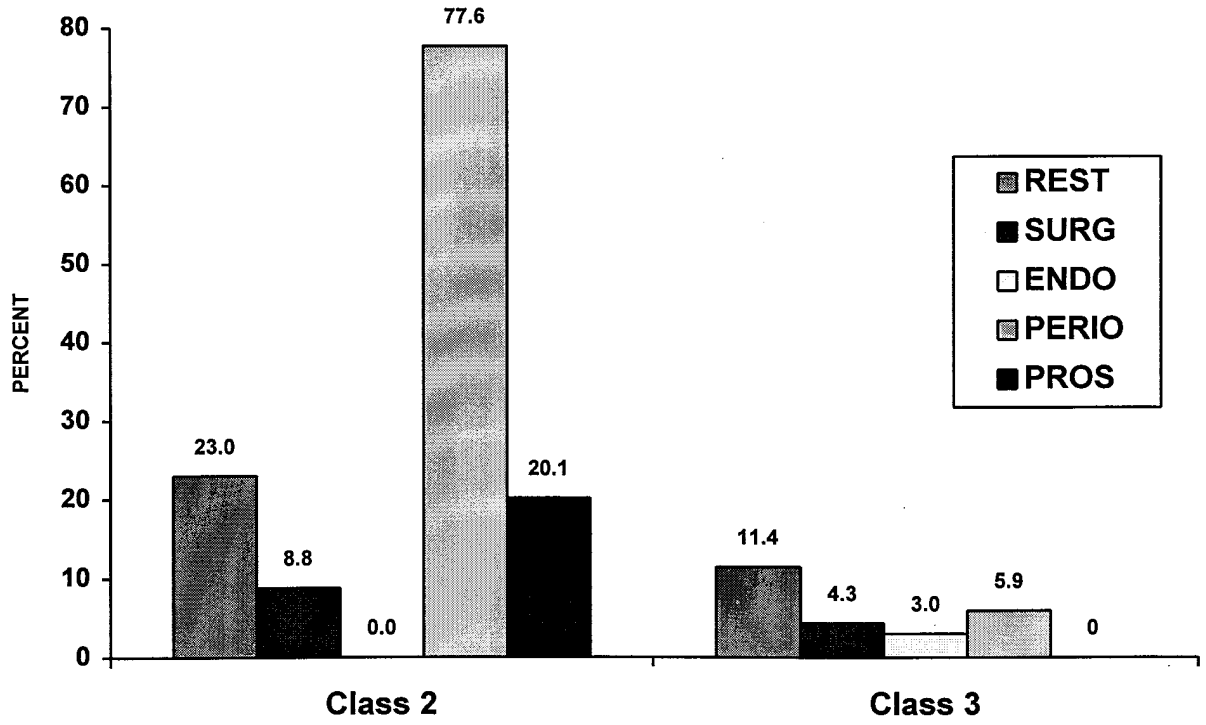


Figure 6 shows the percentage of all non-recruit Navy members in each DoD dental classification by type of treatment need. ***Among Navy members, 11.4% are class 3 due to restorative treatment needs, 4.3% due to oral surgical needs, 3.0% due to endodontic needs, and 5.9% for periodontal reasons.***

Figure 6. Percent of AD USN Members in DoD Dental Classes 2 and 3 by Type of Treatment Need, 1994 TSCOHS



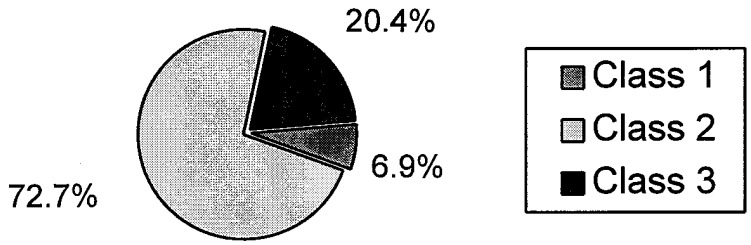
Nearly one-fourth of Navy members are Class 2 due to restorative need. About 9 percent are Class 2 due to oral surgery need. 77.6 percent are Class 2 due to need for periodontal care, and **17.5 percent of Navy members are Class 2 with oral prophylaxis as their sole dental treatment need**. About one fifth are Class 2 because of need for prosthodontic treatment. (Individuals may be class 2 or class 3 for multiple reasons, therefore the total of the treatment need categories exceeds 100 percent).

Table 2 below and Figure 7 on the following page show the dental classifications of non-recruit Navy members by duty status.

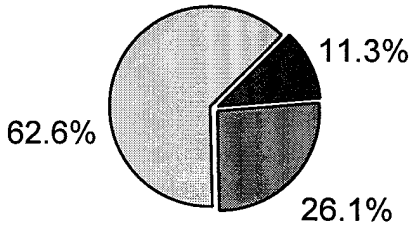
Table 2. Percent of USN Members in each DoD Dental Class by Duty Status, 1994 TSCOHS

	Current Duty Status				
	Submarine	Aviation	Ship	Shore	Marine
DoD Dental Class	%	%	%	%	%
1	6.9	26.1	3.6	11.0	3.7
2	72.8	62.6	64.7	68.3	83.3
3	20.4	11.3	31.6	20.7	13.0
Sample size	361	390	412	2285	364
Population represented	44861	44523	95922	342687	145689

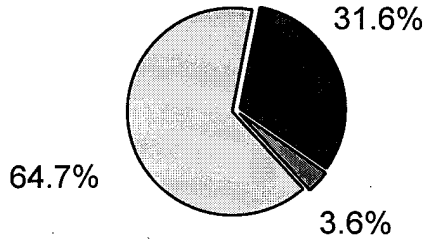
Figure 7. Percent of USN / MARINE CORPS Personnel in each DoD Dental Class by Duty Status and Overall, 1994 TSCOHS



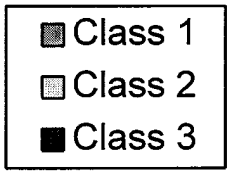
USN SUBMARINE PERSONNEL

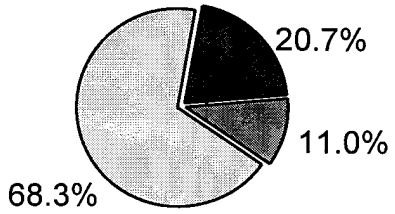


USN AVIATION PERSONNEL

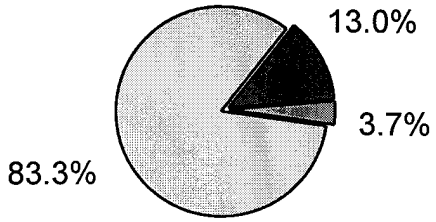


USN SHIP PERSONNEL

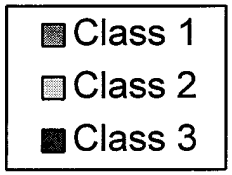


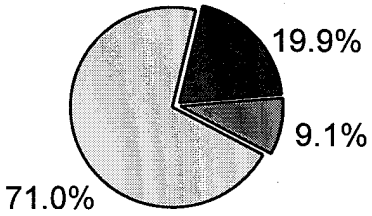


USN SHORE PERSONNEL



US MARINE PERSONNEL





OVERALL NAVY ACTIVE DUTY

Figure 8 shows the percentage of Navy non-recruit members in each dental class along with the self-reported time since their last dental visit . Most Class 1 members had a dental visit within the past year. Fewer Class 2 members and fewer still Class 3 members had dental visits during that period. These differences were not shown to be statistically significant using logistic regression. Essentially all USN members had dental visits within the past two years.

Figure 8. USN Non-recruit AD in each Dental Class by Years Since Last Dental Visit, 1994 TSCOHS

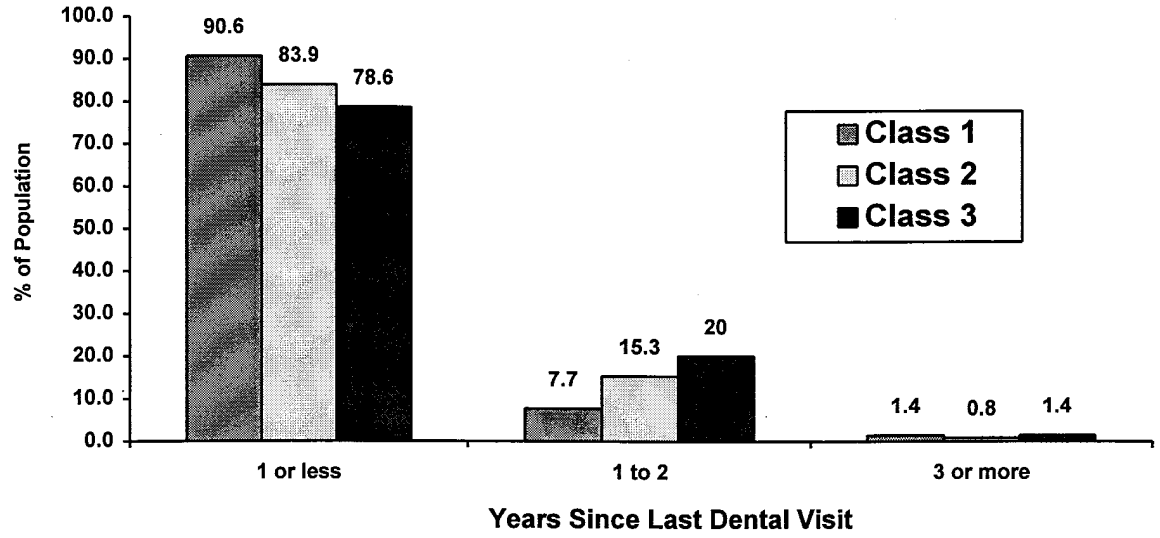
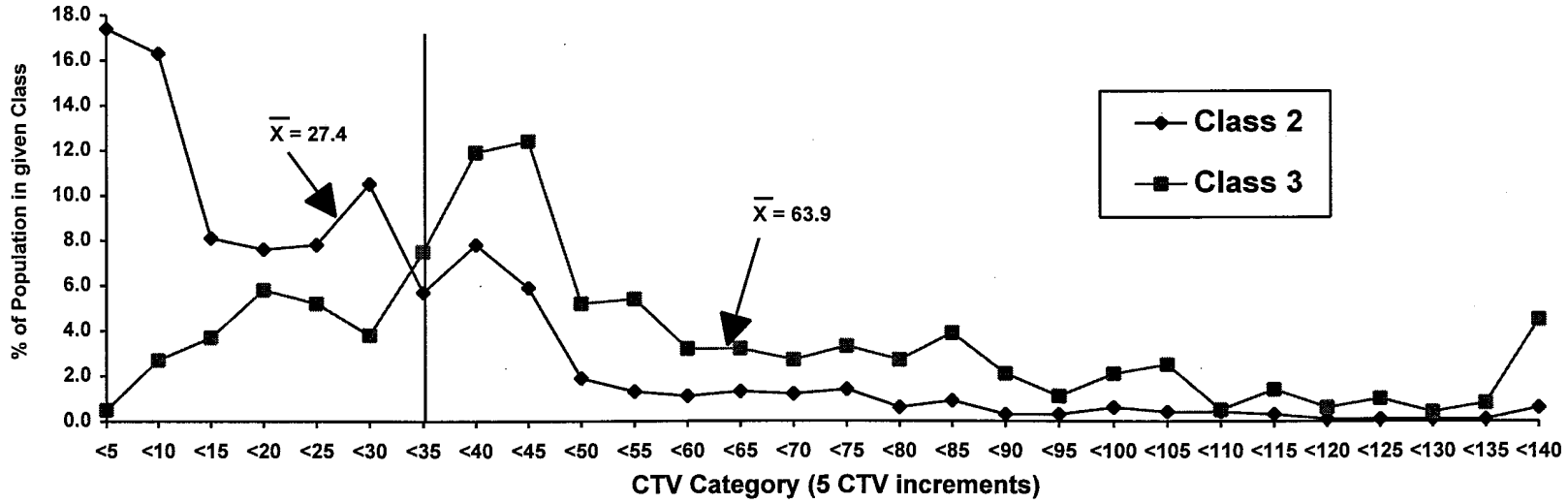


Figure 9 illustrates the distribution of individuals' total dental treatment needs among those who need treatment. Most Class 2 members (73.3%) need less than 35 CTV* total dental care, compared to 19.7% of Class 3 members. Mean CTV needed by those in Class 2 is 27.4 (Tri-Service mean = 35.2 CTV); for those in Class 3, mean CTV needed is 63.9 (Tri-Service mean = 71.4 CTV). An example of a mix of services represented by 35 CTV might include: prophylaxis-12.6 CTV; 3 restorations-11.4 CTV; single cast crown-20.8 CTV = 34.8 CTV.

Figure 9. USN DoD Dental Class by Amount of Treatment Needed (CTV category), 1994 TSCOHS



* Military dentistry uses a Standardized Code on Dental Procedures which is a modification of the American Dental Association's Code on Dental Procedures and Nomenclature. The military code for dental procedures assigns Composite Time Values (CTV) for each procedure to be used for workload accountability. For every episode of dental care delivered, the care provider records a list of the treatment codes involved. This list of codes is then converted to numeric CTV.

APPENDIX

DOD DENTAL CLASSIFICATION CRITERIA

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Source: DoD Instruction 6410.1, *Standardization of Dental Classifications*

CLASS 1 : not requiring dental treatment or reevaluation within 12 months.

A. No dental caries or defective restorations
B. Arrested caries for which treatment is not indicated
C. Healthy periodontium, no bleeding on probing, oral prophylaxis not indicated
D. Replacement of missing teeth not indicated
E. Unerupted, partially erupted, or malposed teeth that are without historical, clinical, or radiographic signs or symptoms of pathosis and are not recommended for prophylactic removal
F. Absence of temporomandibular disorder; stable occlusion

CLASS 2: conditions present which, if not treated or followed up, are **not expected** to, but have the potential to result in dental emergencies within 12 months.

A. Treatment or followup indicated for dental caries with minimal extension into dentin or minor defective restorations easily maintained by the patient where the condition does not cause definitive symptoms
B. Interim restorations or prostheses that can be maintained by the patient where the underlying condition does not cause definitive symptoms. (This includes teeth that have been restored with permanent restorative materials, but for which protective coverage is indicated).
C. Edentulous areas requiring prostheses but not on an immediate basis
D. Periodontal disease or peridontium exhibiting:
   (1) Requirement for oral prophylaxis
   (2) Requirement for maintenance therapy; this includes stable or non-progressive mucogingival conditions requiring periodic evaluation
   (3) Non-specific gingivitis
   (4) Early or mild adult periodontitis
   (5) Supragingival or slight subgingival calculus

CLASS 2: (Cont.)

E. Unerupted, partially erupted, or malposed teeth that are without historical, clinical, or radiographic signs or symptoms of pathosis, but which are recommended for prophylactic removal
F. Active orthodontic treatment
G. Temporomandibular disorder patients in maintenance therapy

CLASS 3: oral conditions which, if not treated, **are expected** to result in dental emergencies within 12 months. When there are questions in determining classification between Class 2 and Class 3, patient should be placed in Class 3.

A. Dental caries, tooth fractures, or defective restorations where the condition extends beyond the dentinoenamel junction and causes definitive symptoms; dental caries with moderate or advanced extension into dentin; and defective restorations not maintained by the patient.
B. Interim restorations or prostheses that cannot be maintained for a 12-month period. (This includes teeth that have been restored with permanent restorative materials but for which protective coverage is indicated).
C. Periodontal diseases or periodontium exhibiting:
    (1) Acute gingivitis or pericoronitis
    (2) Active moderate to advanced periodontitis
    (3) Periodontal abscess
    (4) Progressive mucogingival condition
    (5) Periodontal manifestations of systemic disease or hormonal disturbances
    (6) Moderate to heavy subgingival calculus
D. Edentulous areas or teeth requiring immediate prosthodontic treatment for adequate mastication, communication, or acceptable esthetics
E. Unerupted, partially erupted, or malposed teeth with historical, clinical, or radiographic signs or symptoms of pathosis, that are recommended for removal

CLASS 3: (Cont)

F. Chronic oral infections or other pathologic lesions including:
    (1) Pulpal or periapical pathology requiring treatment
    (2) Lesions requiring biopsy or awaiting biopsy report
G. Emergency situations requiring therapy to relieve pain, treat trauma, treat acute oral infections, or provide timely follow-up care (e.g., drain or suture removal) until resolved
H. Temporomandibular disorder requiring active treatment